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THE RELATIONSHIPS OF ATTITUDES TO READING COMPREHENSION IN THE INTERMEDIATE GRADES.

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IN A STUDY TO DETERMINE THE EFFECT OF ATTITUDES ON LEARNING, THE LITERAL AND INTERPRETATIVE COMPREHENSION ABILITIES OF INTERMEDIATE GRADE CHILDREN ON THEMATICALLY BASED READING SELECTIONS WERE COMPARED WITH THEIR ATTITUDES TOWARD THAT MATERIAL. THREE OF THE MOST COMMON READING THEMES INHERENT IN CHILDREN'S STORIES WERE DETERMINED BY A PANEL OF GRADUATE STUDENTS, UNIVERSITY PROFESSORS, AND THE INVESTIGATORS WHICH CONDUCTED A SURVEY OF THE LITERATURE. AT EACH GRADE LEVEL, THREE STORIES WERE SELECTED FOR EACH THEME. SUBJECTS WERE 285 CHILDREN IN GRADES 4, 5, AND 6 IN ALBEMARLE COUNTY, VIRGINIA. EACH CHILD READ NINE STORIES. AN ATTITUDE INVENTORY WAS CONSTRUCTED FOR EACH THEME USING PROCEDURES RECOMMENDED BY THURSTONE. FOR EACH STORY, COMPREHENSION TESTS OF 10 LITERAL AND 10 INTERPRETATIVE QUESTIONS WERE ADMINISTERED. AN ANALYSIS OF THE DATA LED TO THE FOLLOWING CONCLUSIONS. THE IMPORTANCE OF ATTITUDES IN IMPROVING COMPREHENSION WAS QUESTIONABLE. WHEN DIFFERENT VARIABLES WERE CONTROLLED, ATTITUDES APPEARED NOT TO FUNCTION APPRECIABLY IN INTERMEDIATE GRADES AND TO FUNCTION DIFFERENTLY FOR LITERAL AND INTERPRETATIVE COMPREHENSION. LITERAL AND INTERPRETATIVE COMPREHENSION WERE DIFFERENTIALLY AFFECTED BY SEX. RELATIONSHIPS BETWEEN ATTITUDE AND COMPREHENSION WERE UNAFFECTED BY RACE OR SOCIOECONOMIC STATUS. TABLES AND A BIBLIOGRAPHY ARE INCLUDED. (RH)

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THE RELATIONSHIPS OF ATTITUDES TO READING COMPREHENSION IN THE INTERMEDIATE GRADES

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INTRODUCTION

There is a widely-held belief that attitudes may be used to advantage in increasing educational achievement. This has resulted in overly-simplified solutions to educational problems. Today many textbooks and materials are being written which do nothing but portray positive attitudes toward racial and socio-economic groups in an attempt to solve the educational problems of these groups. This study questions this belief and its application to reading comprehension.

The purpose of this study was to examine the reader in grades four through six with regard to the manner in which his attitude toward certain thematic content is related to his comprehension of reading selections. Specifically, the procedures for this study were such as to compare the literal and interpretative comrepehnsion abilities of intermediate grade children on certain thematically based reading selections with their attitudes toward that material.

DEFINITION OF TERMS AND CONSTRUCTS

Attitude was defined as a relatively stable tendency to respond in a favorable or unfavorable fashion to specific reading themes. As such the construct includes a predisposition and affective factors. It may be distinguished from the term interest on the grounds that interest merely implies a conscious desire to hold a psychological object before the conscious mind; therefore, the construct does not, of necessity, imply any affective factor.

Reading themes were defined as specific motifs that so often recur in the stories utilized to characterize them. The first theme, labeled the anthropomorphic, was found in success stories of animals who possessed the virtuous human characteristics of honesty, humility, and courage and who are the principal story characters. The second themewas based on the victorious underdog or weaker story character who played the principal role in tales. The third theme was concerned with the primary story character who possessed quite definite culturally-alien attirubutes which facilitated group endeavor and harmony.

Reading comprehension was defined as both a method of obtaining meaning and that meaning as a body after it had been extracted from graphic stimuli. It was defined as being comprised of two major types, the literal and the interpretative. Literal comprehension was defined as the ability to identify

and utilize the primary and direct meaning of a word, idea, or sentence in context. Interpretative comprehension was defined as the ability to compare and associate a given idea with similar ideas and then relate them according to the experiential background of the reading. As such, it involved the obtainment or anticipation of deeper meanings not directly stated in the text. When both literal and interpretative comprehension were considered in combination, it was called total or general reading comprehension.

TECHNIQUES AND PROCEDURES

1. Three of the most common reading themes inherent within children's stories at intermediate grade levels were determined by a panel of graduate students, university professors, and the investigator, through a survey of the literature. Typical intermediate grade reading selections believed to be characterized by these themes were then selected by the same panel on the basis of consensus. The main criterion utilized was consistency of theme throughout a given story. Three stories were selected at each grade level for each theme in order to compensate for differences in author, style, and mood. Consequently, each child read a total of nine stories.

2. An attitude inventory was then constructed to measure student reaction to each theme using procedures recommended by Thurstone. (The original source opinions numbering some 2000

were derived from intermediate grade children not used in the study by means of a questionnaire.) In selecting items for these generalized and abstract attitude inventories, judges sorted 600 opinions reflecting attitude toward each of the three themes into seven categories spaced along a continuum of favorableness. The resulting three attitude inventories consisted of responses to the following three attitudes: the anthropomorphic, the underdog, and the culturally-alien. Each category contained items which appeared equally more favorable than items in the preceding category and equally less favorable than items placed in the following category. This permitted a rank ordering over the entire continuum of the attitude according to an equal-in-appearance gradation of items. Validity for the inventory was based on construct and logical validity. Both types of validity permitted analysis of variance and covariance techniques to be used. The reliability of these inventories determined by the Kuder-Richardson Formula 21 were: anthropomorphic, .81; underdog, .82; and culturally-alien, .85. (Table 1 shows the partial and total reliability coefficients.)

3. Comprehension tests were then administered to all the children in the sample. These were constructed by writing 10 literal comprehension questions and 10 interpretative questions for each of the stories chosen. This procedure permitted part scores for each of the major types of comprehension as well as a total score. Criteria for item selection were derived on

Table 1

Reliability Coefficients by Grade and Theme Obtained Through Application of the Kuder-Richardson Formula 21 for the Comprehension Tests Administered

Comprehension Tests	Grades	r11
Anthropomorphic theme test 1	4	.7543
Anthropomorphic theme test 2	4	.7837
Anthropomorphic theme test 3	4	.7649
Three Anthropomorphic tests combined	4	.7603
Anthropomorphic theme test 4	5	.8631
Anthropomorphic theme test 5	5	.8245
Anthropomorphic theme test 6	5	.7779
Three Anthropomorphic tests combined	5	.8167
Anthropomorphic theme test 7	6	.6998
Anthropomorphic theme test 8	6	.7966
Anthropomorphic theme test 9	6	.8432
Three Anthropomorphic tests combined	6	.7767
Underdog theme story 1	4	.6904
Underdog theme story 2	4	.7449
Underdog theme story 3	4	.8432
Three Underdog tests combined	4	.7565
Underdog theme story 4	5	.8245
Underdog theme story 5	5	.8451
Underdog theme story 6	5	.7387
Three Underdog tests combined	5	.8032
Underdog theme story 7	6	.7710
Underdog theme story 8	6	.8356
Underdog theme story 9	6	.7368
Three Underdog tests combined	6	.7834
Culturally-alien theme story 1	4	.7077
Culturally-alien theme story 2	4	.8749
Culturally-alien theme story 3	4	.8137
Three Culturally-alien tests combined	4	.7968
Culturally-alien theme story 4	5	.7993
Culturally-alien theme story 5	5	.8254
Culturally-alien theme story 6	5	.8631
Three Culturally-alien tests combined	5	.8060
Culturally-alien theme story 7	6	.7874
Culturally-alien theme story 8	6	.8282
Culturally-alien theme story 9	6	.7333
Three Culturally-alien tests combined	6	.7811

the basis of the operational definitions, construct validity, and on a consensus among the director of the McGuffey Reading Clinic, two advanced doctoral candidates in the field of reading and the investigators. The methods for determining validity were effective. On the basis of the completed test reaults, the mean achievement on the literal always exceeded the interpretative as predicted (shown in Table 2).

4. A sample of 285 children in grades four, five, and six was then selected from the study body of two elementary schools of the Albemarle County Public School System. This sample was representative of children at these age levels as can be seen from the data in Table 2. The mean I.Q. was 104; the mean reading achievement was fifth grade, and the mean age was approximately 11 years; there were 51 per cent boys and 49 per cent girls, 87 per cent Caucasian and 13 per cent Negroes. Specifically, children from the two elementary schools used in the study were initially given the Henmon-Nelson Test of Mental Abilities, the Durrell-Sullivan Reading Achievement Test, and the Attitude Inventories to determine their ability and attitudinal range and for purposes of statistical control. Tests of normality indicated that these traits were normally distributed in the sample group.

The sample studied may be regarded as a representative sample of intermediate grade populations. Results of normality tests indicated that the children in the sample fell across the

Table 2

Listing of the Means and Standard Deviation of all Variables

	Variable	Mean	SD
1.	School A	.38	.48
2.	School B	.62	.48
3.	Male	.51	.50
4.	Female	.49	.50
5.	Caucasian	.87	.33
6.	Negroid	.13	.33
7.	Unit Vector	-	-
8.	Grade IV	.35	.48
9.	Grade V	.34	.47
10.	Grade VI	.31	.46
11.	Age	130.93	12.35
12.	IQ	103.88	13.62
13.	Reading Achievement	5.07	1.10
14.	Anthropomorphic Attitude Scale	2.92	1.68
15.	Anthropomorphic Attitude Scale odd items	2.99	1.46
16.	Anthropomorphic Attitude Scale even items	3.16	1.60
17.	Underdog Attitude Scale	2.99	1.43
18.	Underdog Attitude Scale odd items	3.04	1.31
19.	Underdog Attitude Scale even items	3.04	1.43
20.	Culturally Alien Attitude Scale	3.30	1.83
21.	Culturally Alien Attitude Scale odd items	3.27	1.66
22.	Culturally Alien Attitude Scale even items	3.40	1.72
23.	Individual response to anthropomorphic theme story (literal and interpretative)	15.84	2.77
24.	Individual response to anthropomorphic theme story - odd items (literal	8.14	1.71
25.	Individual response to anthropomorphic theme story - even items (interpretative)	7.69	1.62
26.	Individual response to anthropomorphic theme story (literal and interpretative)	15.04	2.61
27.	Individual response to anthropomorphic theme story - odd items (literal)	7.99	1.77
28.	Individual response to anthropomorphic theme story - even items (interpretative)	7.05	1.71

Table 3 (Continued)

	Variable	Mean	SD
29.	Individual response to anthropomorphic theme story (literal and interpretative)	14.77	2.60
30.	Individual response to anthropomorphic theme story - odd items (literal	7.60	1.63
31.	Individual response to anthropomorphic theme story - even items (interpretative)	7.17	1.64
32.	YI (Total combination literal and interpretative scores of 3 tests reflecting on anthropomorphic theme)	45.58	5.98
33.	YIA (Total literal scores of 3 tests reflecting on anthropomorphic theme)	23.75	3.66
34.	YIB (Total interpretative scores of 3 tests reflecting on anthropomorphic theme)	21.85	3.66
35.	Individual story response to underdog theme (literal and interpretative)	15.04	2.79
36.	Individual response to underdog theme - odd items (literal)	7.81	1.74
37.	Individual response to underdog theme - even items (interpretative)	7.19	1.69
38.	Individual story response to underdog theme (literal and interpretative)	15.46	2.69
39.	Individual story response to underdog theme-odd items (literal)	7.85	1.69
40.	Individual story response to underdog theme-even items (interpretative)	7.61	1.72
41.	Individual story response to underdog theme (literal and interpretative)	14.32	2.81
42.	Individual story response to underdog theme-odd items (literal)	7.47	1.80
43.	Individual story response to underdog theme - even items (interpretative)	6.84	1.66
44.	YII (Total literal and interpretative scores of 3 tests reflecting on underdog theme)	44.68	6.19
45.	YIIA (Total literal scores of 3 tests reflecting on underdog theme)	23.16	3.58
46.	YIIB (Total interpretative scores of 3 tests reflecting on underdog theme)	21.60	3.59
47.	Individual comprehension response to culturally alien theme story (literal and interpretative)	15.49	2.87
48.	Individual comprehension response to culturally alien theme story - odd items (literal)	7.73	1.67
49.	Individual comprehension response to culturally alien theme story - even items (interpretative)	7.76	1.74

Table 2(continued)

Variable	Mean	SD
50. Individual comprehension response to culturally-alien theme story (literal and interpretative)	15.41	2.85
51. Individual comprehension response to culturally-alien theme story - odd items (literal)	7.89	1.72
52. Individual comprehension response to culturally-alien theme story - even items (interpretative)	7.52	1.71
53. Individual comprehension response to culturally-alien theme story (literal and interpretative)	15.22	2.45
54. Individual comprehension response to culturally-alien theme story - odd items (literal)	7.82	1.59
55. Individual comprehension response to culturally alien theme story - even items (interpretative)	7.39	1.62
56. YIII (Total literal and interpretative scores of 3 tests reflecting a culturally-alien theme)	46.05	6.38
57. YIIIA (Total literal scores of 3 tests reflecting a culturally-alien theme)	23.47	3.45
58. YIIIB (Total interpretative scores of 3 tests reflecting a culturally-alien theme)	22.60	3.91
59. Socio-economic status	3.97	1.66

entire range of intelligence levels, ages, grade levels, race, sex, reading achievement levels, socio-economic levels and attitudes. Generalizations to these populations then are appropriate.

DESIGN, ANALYSIS, RESULTS AND CONCLUSIONS

The study was designed so that the analysis of the data could be accomplished by the variance and covariance techniques of multiple linear regression as described by Bottenberg and Ward.

Such an analysis utilizes criterion and predictor variables in Full and Restricted Regression Models. The criterion variables were the individual scores on the three different comprehension tests, total, literal, and interpretative, for each of the three attitudes. Each criterion gave a Full Regression Model.

The predictor variables included attitudinal scores, intelligence scores, race identification, socio-economic identification and other variables (eight in all) which are specified as factors in the subordinate hypotheses. All variables and their identifying number are listed in Table 2.

The nine Full Regression Models and their necessary characteristics are listed in Tables 3 through 11 in the Appendix. For each Full Model 17 Restricted Models are listed, each of which was generated from a hypothesis to be tested. The first Restricted Model is used to test the primary null hypothesis.

The next two Restricted Models are used to test subordinate hypotheses about the school factor, one of the eight secondary variables, and about the combinatorial effect of the school and attitude factors. This is repeated for each of the eight variables. Thus, there is a primary Restricted Model and eight pairs of subordinate Restricted Models for a total of 17.

The hypotheses, results, and conclusions are as follows.

Primary Null Hypotheses

Attitude toward each of three given themes as reflected in reading selections does not affect recalled total comprehension response. Results indicate that the hypothesis could not be rejected for any reading materials reflecting the three themes. It was concluded that significant differences in total recalled comprehension response, literal and interpretative, could not be traced to differences in anthropomorphic, underdog, or culturally-alien attitude.

The hypothesis that attitude toward given thematically based reading selections does not affect recalled literal comprehension was rejected (at the 5 per cent significance level) insofar as reading selections of a culturally-alien theme were concerned. It was concluded that significant difference in literal comprehension response to reading materials of a culturally-alien theme could be attributed to differences in a culturally-alien attitude. It was further concluded that differences in literal comprehension responses to reading

materials of an anthropomorphic or underdog theme could not be traced to differences in anthropomorphic or underdog attitude.

The hypothesis that attitude towards given thematically based reading selections does not affect recalled interpretative response was rejected (at the five per cent level of significance) insofar as reading selections of an underdog theme were concerned. It was concluded that significant differences in recalled interpretative comprehension response could be attributed to differences in underdog attitude. It was also concluded, that differences in recalled interpretative comprehension response to reading materials of an anthropomorphic or culturally-alien theme could not be traced to differences in anthropomorphic or culturally-alien attitudes.

Subordinate Null Hypotheses

Subordinate hypotheses dealt with the premises that any relationship between recalled total, literal, or interpretative comprehension response (each taken separately) were not dependent on factors of or on the combinatorial effect of attitude and each of the factors of:

a. school
b. sex
c. race
d. chronological age
e. intelligence level
f. general reading ability
g. socio-economic status
h. grade level.

Results indicated that any difference in the relationship between an anthropomorphic, an underdog, or a culturally-alien attitude and recalled literal comprehension response or recalled interpretative comprehension response can not be attributed to differences in:

a. socio-economic status (as measured by father's occupation), and

b. race.

Results also indicated that any difference in the relationships between an anthropomorphic, an underdog, or a culturally-alien attitude and recalled literal comprehension response or recalled interpretative response can be attributed (5 per cent significance level) to the factors of:

a. grade level

b. school

c. intelligence level

d. general reading ability,

e. chronological age, and

f. sex

IMPLICATIONS

These data provide implications for reading theory and practice.

1. The study indicates that when a number of variables are controlled, attitudes that have been assumed to have a strong bearing on total reading comprehension do not appear

to function appreciably in intermediate grade classes and to function differentially for literal and interpretative comprehension. Consequently, partial results question the importance of considering attitudes as a means of improving comprehension.

2. If attempts are made to increase comprehension by means of attitudinal materials, distinctions between literal and interpretative comprehension should be made.

3. As literal and interpretative reading comprehension are differentially affected by sex, an argument can be made for having different stories for different sexes.

4. It was found that the relationships between attitude and reading comprehension were not affected by variables of race or socio-economic status. Consequently, materials written primarily to develop or enhance comprehension for certain racial or socio-economic groups seem to offer little promise. Thus, improvement in reading achievement for such groups must be accomplished through some other means.

5. While the literature indicated that the Thrustone method of determining attitude is one of the most valid and reliable, it is a measurement of a generalized attitude and may not be as appropriate for measuring the relationships of attitudes to reading comprehension as a method of attitude appraisal which takes account of the specific mood of the material being read. The Likert procedure has been selected as an alternative method for such an appraisal in a study now underway and the findings will compare the two techniques.

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APPENDIX

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Table 3

Multiple Correlations with Full Comprehension Scores (YI) and Percentage of Criterion Variance Accounted for by Anthropomorphic Attitude (AI) with each Variable Taken Separately, AI Taken Separately, and AI with every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.2785				
1. All variables except AI	16	.2783	.0606	1	274	
2. All variables except school	16	.2732	2.0130	1	274	
3. All variables except school and AI	15	.2728	1.0741	2	274	
4. All variables except sex	16	.2681	3.9318	1	274	*
5. All variables except sex and AI	15	.2677	2.0331	2	274	
6. All variables except race	16	.2768	.6108	1	274	
7. All variables except race and AI	15	.2767	.3307	2	274	
8. All variables except age and grade divisions	13	.2107	6.8190	1	276	*
9. All variables except age, AI, and grade divisions	12	.2072	4.0421	2	276	*
10. All variables except IQ	16	.2781	.1439	1	274	
11. All variables except IQ and AI	15	.2780	.0806	2	274	
12. All variables except reading ability	16	.1321	55.5015	1	274	*
13. All variables except reading ability and AI	15	.1270	28.7612	2	274	*
14. All variables except socio-economic status	16	.2777	.2928	1	274	
15. All variables except socio-ec. status and AI	15	.2775	.1741	2	274	
16. All variables except grade divisions	16	.2297	9.2489	2	274	*
17. All variables except grade divisions and AI	15	.2293	6.2230	3	274	*

*Number of Predictor variables

**Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variances accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) The formula is: $F = \frac{(q2 - q1)/(df)_1}{q1/(df)_2}$

****Starred variables indicate significance at the .05 level of confidence

$(df)_1$ Degrees of freedom - numerator

$(df)_2$ Degrees of freedom - denominator

Table 4

Multiple Correlations with Literal Comprehension Scores (YIA) and Percentage of Criterion Variance Accounted for by Anthropomorphic Attitude (A1) with Each Variable Taken Separately, A1 Taken Separately, and A1 with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.2551				
1. All variables except A1	16	.2550	.0172	1	274	
2. All variables except school	16	.2388	5.9782	1	274	*
3. All variables except school and A1	15	.2385	3.0467	2	274	*
4. All variables except sex	16	.2526	.9069	1	274	
5. All variables except sex and A1	15	.2525	.4713	2	274	
6. All variables except race	16	.2539	.4480	1	274	
7. All variables except race and A1	15	.2538	.2304	2	274	
8. All variables except age and grade divisions	13	.1833	11.6325	1	276	*
9. All variables except age, A1, and grade divisions	12	.1816	6.1067	2	276	*
10. All variables except IQ	16	.2489	2.2745	1	274	
11. All variables except IQ and A1	15	.2485	1.2062	2	274	
12. All variables except reading ability	16	.1537	37.2962	1	274	*
13. All variables except reading ability and A1	15	.1495	19.4141	2	274	*
14. All variables except socio-economic status	16	.2551	.0024	1	274	
15. All variables except socio-ec. status and A1	15	.2550	.0099	2	274	
16. All variables except grade divisions	16	.2163	7.1299	2	274	*
17. All variables except grade divisions and A1	15	.2163	4.7619	3	274	*

* Number of Predictor variables

** Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

*** F Test as described by Bottenberg and Ward (1963, ch. 2) The formula is: $F = \frac{(q2 - q_1)/(df)1}{q1/(df)2}$

**** Starred variables indicate significance at the .05 level of confidence

$(df)_1$ Degrees of freedom - numerator

$(df)_2$ Degrees of freedom - denominator

Table 5

Multiple Correlations with Interpretative Comprehension Scores (YIB) and Percentage of Criterion Variance Accounted for by Anthropomorphic Attitude (A1) with Each Variable Taken Separately, A1 Taken Separately, and A1 with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.2719				
1. All variables except A1	16	.2716	.1367	1	274	
2. All variables except school	16	.2717	.0637	1	274	
3. All variables except school and A1	15	.2714	.0930	2	274	
4. All variables except sex	16	.2562	5.9261	1	274	*
5. All variables except sex and A1	15	.2555	3.0972	2	274	*
6. All variables except race	16	.2708	.4325	1	274	
7. All variables except race and A1	15	.2704	.2782	2	274	
8. All variables except age and grade divisions	13	.1581	1.0877	1	276	
9. All variables except age, A1, and grade divisions	12	.1555	.9693	2	276	
10. All variables except IQ	16	.2686	1.2350	1	274	
11. All variables except IQ and A1	15	.2671	.9109	2	274	
12. All variables except reading ability	16	.1315	34.0327	1	274	*
13. All variables except reading ability and A1	15	.1792	17.4503	2	274	*
14. All variables except socio-economic status	16	.2675	1.6690	1	274	
15. All variables except socio-ec. status and A1	15	.2671	.8938	2	274	
16. All variables except grade divisions	16	.1614	20.7887	2	274	*
17. All variables except grade divisions and A1	15	.1603	14.0044	3	274	*

* Number of Predictor variables

** Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

*** F Test as described by Bottenberg and Ward (1963, ch.2) The formula is: $F = \frac{(q2 - q1)/(df)1}{q1/(df)2}$

**** Starred variables indicate significance at the .05 level of confidence

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 5

Multiple Correlations with Full Comprehension Scores (YII) and Percentage of Criterion Variance Accounted for by Underdog Attitude (AII) with Each Variable Taken Separately, All Taken Separately, and AII with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.2118				
1. All variables except A2	16	.2023	3.2830	1	274	
2. All variables except school	16	.2004	3.9396	1	274	*
3. All variables except school and A2	15	.1911	3.5835	2	274	*
4. All variables except sex	16	.1993	4.3360	1	274	*
5. All variables except sex and A2	15	.1874	4.2415	2	274	*
6. All variables except race	16	.2103	.5000	1	274	
7. All variables except race and A2	15	.2007	1.9258	2	274	
8. All variables except age and grade divisions	13	.1432	7.1358	1	276	*
9. All variables except age, A2, and grade divisions	12	.1392	4.2422	2	276	*
10. All variables except IQ	16	.2030	3.0409	1	274	
11. All variables except IQ and A2	15	.1982	2.1588	2	274	
12. All variables except reading ability	16	.1310	28.0719	1	274	*
13. All variables except reading ability and A2	15	.1292	14.3402	2	274	*
14. All variables except socio-economic status	16	.2115	.0992	1	274	
15. All variables except socio-ec. status and A2	15	.2021	1.6725	2	274	
16. All variables except grade divisions	16	.1648	8.1548	2	274	*
17. All variables except grade divisions and A2	15	.1571	6.3389	3	274	*

*Number of Predictor variables

** Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

*** F Test as described by Bottenberg and Ward (1963, ch. 2) The formula is: $F = \frac{(q2 - q1)/(df)1}{q1/(df)2}$

**** Starred variables indicate significance at the .05 level of confidence

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 7

Multiple Correlations with Literal Comprehension Scores (YIIA) and Percentage of Criterion Variance Accounted for by Underdog Attitude (AII) with Each Variable Taken separately, All Taken Separately, and AII with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.1672				
1. All variables except A2	16	.1645	.2913	1	274	
2. All variables except school	16	.1550	4.0171	1	274	*
3. All variables except school and A2	15	.1524	2.4396	2	274	
4. All variables except sex	16	.1565	3.5217	1	274	
5. All variables except sex and A2	15	.1526	2.1438	2	274	
6. All variables except race	16	.1634	1.2761	1	274	
7. All variables except race and A2	15	.1605	1.1119	2	274	
8. All variables except age and grade divisions	13	.1419	2.6157	1	276	
9. All variables except age, A2, and grade divisions	12	.1409	1.4600	2	276	
10. All variables except IQ	16	.1616	1.8334	1	274	
11. All variables except IQ and A2	15	.1607	1.0484	2	274	
12. All variables except reading ability	16	.1001	22.0857	1	274	*
13. All variables except reading ability and A2	15	.1001	11.0430	2	274	*
14. All variables except socio-economic status	16	.1670	.1067	1	274	
15. All variables except socio-ec. status and A2	15	.1641	.5109	2	274	
16. All variables except grade divisions	16	.1500	2.1459	2	274	
17. All variables except grade divisions and A2	15	.1479	2.1256	3	274	

*Number of Predictor variables

** Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) The formula is: $F = \frac{(q2 - q1)/(df)1}{q1/(df)2}$

****Starred variables indicate significance at the .05 level of confidence

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 8

Multiple Correlations with Interpretative Comprehension Scores (YIIB) and Percentage of Criterion Variance Accounted for by Underdog Attitude (AII) with Each Variable Taken Separately, AII Taken Separately, and AII with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance ****
All variables as listed in Table	17	.1634				
1. All variables except A2	16	.1516	3.8968	1	274	*
2. All variables except school	16	.1603	1.0276	1	274	
3. All variables except school and A2	15	.1485	2.1467	2	274	
4. All variables except sex	16	.1556	2.5589	1	274	
5. All variables except sex and A2	15	.1415	3.5899	2	274	*
6. All variables except race	16	.1634	.0053	1	274	
7. All variables except race and A2	15	.1516	1.9487	2	274	
8. All variables except age and grade divisions	13	.0795	7.4743	1	276	*
9. All variables except age, A2, and grade divisions	12	.0739	4.5989	2	276	*
10. All variables except IQ	16	.1570	2.1286	1	274	
11. All variables except IQ and A2	15	.1494	2.2978	2	274	
12. All variables except reading ability	16	.1109	17.2070	1	274	*
13. All variables except reading ability and A2	15	.1657	9.2967	2	274	*
14. All variables except socio-economic status	16	.1618	.5260	1	274	
15. All variables except socio-ec. status and A2	15	.1502	2.1620	2	274	
16. All variables except grade divisions	16	.1038	9.7750	2	274	*
17. All variables except grade divisions and A2	15	.0937	7.6202	3	274	*

*Number of Predictor variables

**Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) The Formula is: $F = \frac{(q2 - q1) / (df)_1}{q1 / (df)_2}$

**** Starred variables indicate significance at the .05 level of confidence

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 5

Multiple Correlations with Full Comprehension Scores (YIII) and Percentage of Criterion Variance Accounted for by Culturally-Alien Attitude (AIII) with Each Variable Taken Separately, AIII Taken Separately, and AIII with Every Other Relevant Variable

Variables	P*	RSQ*	F***	$(df)_1$	$(df)_2$	Significance****
All variables as listed in Table	17	.3132				
1. All variables except A3	16	.3069	2.4948	1	274	
2. All variables except school	16	.3084	1.9146	1	274	
3. All variables except school and A3	15	.3024	2.1419	2	274	
4. All variables except sex	16	.3118	.5330	1	274	
5. All variables except sex and A3	15	.3055	1.5345	2	274	
6. All variables except race	16	.3133	.7376	1	274	
7. All variables except race and A3	15	.3050	1.6269	2	274	
8. All variables except age and grade divisions	13	.3125	.2664	1	276	
9. All variables except age, A3, and grade divisions	12	.2679	2.6251	2	276	*
10. All variables except IQ	16	.3076	2.2327	1	274	
11. All variables except IQ and A3	15	.3040	1.8197	2	274	
12. All variables except reading ability	16	.2062	42.6651	1	274	*
13. All variables except reading ability and A3	15	.2046	21.6511	2	274	*
14. All variables except socio-economic status	16	.3085	1.8654	1	274	
15. All variables except socio-ec. status and A3	15	.3016	2.3099	2	274	
16. All variables except grade divisions	16	.2816	6.2967	2	274	*
17. All variables except grade divisions and A3	15	.2683	5.9711	3	274	*

*Number of Predictor Variables

**Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) $F = \dfrac{(q_2 - q_1) / (df)_1}{q_1 / (df)_2}$

****Starred variables indicate significance at the .05 level of confidence.

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 10

Multiple Correlations with Literal Comprehension Scores (YIIIA) and Percentage of Criterion Variance Accounted for by Culturally-Alien Attitude (AIII) with Each Variable Taken Separately, AIII Taken Separately, and AIII with Every Other Relevant Variable

Variables	P*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance ****
All Variables as listed in Table	17	.2532				
1. All variables except A3	16	.2402	4.7654	1	274	*
2. All variables except school	16	.2466	2.4407	1	274	
3. All variables except school and A3	15	.2341	3.5052	2	274	*
4. All variables except sex	16	.2503	1.0780	1	274	
5. All variables except sex and A3	15	.2371	1.9622	2	274	
6. All variables except race	16	.2504	1.0274	1	274	
7. All variables except race and A3	15	.2373	1.9139	2	274	
8. All variables except age and grade divisions	13	.2516	.6051	1	276	
9. All variables except age, A3, and grade divisions	12	.1876	4.6449	2	276	*
10. All variables except IQ	16	.2318	7.8406	1	274	*
11. All variables except IQ and A3	15	.2264	4.9166	2	274	*
12. All variables except reading ability	16	.1865	24.4854	1	274	*
13. All variables except reading ability and A3	15	.1765	13.5199	2	274	*
14. All variables except socio-economic status	16	.2489	1.5934	1	274	
15. All variables except socio-ec. status and A3	15	.2350	3.3464	2	274	*
16. All variables except grade divisions	16	.2141	7.1767	2	274	*
17. All variables except grade divisions and A3	15	.1899	7.7391	3	274	*

*Number of Predictor Variables

**Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) $F = \frac{(q_2 - q_1) / (df)_1}{q_1 / (df)_2}$

****Starred variables indicate significance at the .05 level of confidence

(df)1 Degrees of freedom - numerator

(df)2 Degrees of freedom - denominator

Table 11

Multiple Correlations with Interpretative Comprehension Scores (YIIIB) and Percentage of Criterion Variance Accounted for by Culturally-Alien Attitude (AIII) with Each Variable Taken Separately, AIII Taken Separately, and AIII with Every Other Relevant Variable

Variables	p*	RSQ**	F***	$(df)_1$	$(df)_2$	Significance ****
All variables as listed in Table	17	.2488				
1. All variables except A3	16	.2481	.2666	1	274	
2. All variables except school	16	.2476	.4361	1	274	
3. All variables except school and A3	15	.2770	.3416	2	274	
4. All variables except sex	16	.2485	.1326	1	274	
5. All variables except sex and A3	15	.2477	.2029	2	274	
6. All variables except race	16	.2481	.2717	1	274	
7. All variables except race and A3	15	.2473	.2713	2	274	
8. All variables except age grade divisions	13	.2343	.0916	1	276	
9. All variables except age, A3, and grade divisions	12	.2318	.4958	2	276	
10. All variables except IQ	16	.2459	1.0586	1	274	
11. All variables except IQ and A3	15	.2478	.1937	2	274	
12. All variables except reading ability	16	.1540	34.5959	1	274	*
13. All variables except reading ability and A3	15	.1539	17.3160	2	274	*
14. All variables except socio-economic status	16	.2463	.9288	1	274	
15. All variables except socio-ec. status and A3	15	.2454	.6279	2	274	
16. All variables except grade divisions	16	.2346	2.1011	2	274	
17. All variables except grade divisions and A3	15	.2319	1.0510	3	274	

*Number of Predictor variables

**Squared Multiple Correlation Coefficients. Equal to the ratio of the criterion variance accounted for by the prediction system.

***F Test as described by Bottenberg and Ward (1963, ch. 2) $F = \frac{(R^2_2 - R^2_1) / q_1}{(1 - R^2_2) / (df)_2}$

****Starred variables indicate a significance at the .05 level of confidence

$(df)_1$ Degrees of freedom - numerator

$(df)_2$ Degrees of freedom - denominator